

What is claimed is:

1. A liquid level assembly for use with a pump, comprising:
switching means responsive to liquid head pressure for actuating the pump;
a housing having an internal cavity in which the switching means is supported
5 and having an open end;
seal means for sealing the open end of the housing and for transmitting
pressure of the liquid head to the switching means, the seal means
comprising:
a diaphragm seal having a center planar portion disposed to abut the
10 switching means, a peripherally extending web portion and a
flexible bellows portion connecting the planar portion and the
peripheral web portion; and
a plurality of knob members extending from the peripheral web portion
disposed to press against the switching means.
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2. The liquid level assembly of claim 1 wherein the housing assembly
comprises:
an upper housing member, the internal cavity being therein;
a lower housing member;
20 means for attaching the lower housing member to the upper housing member,
the seal means being disposed between the lower housing member and
the upper housing member, and the internal cavity sealed thereby.

3. The liquid level assembly of claim 2 wherein the lower housing member has at least one opening whereby liquid head pressure is exerted on the diaphragm seal.

5 4. The liquid level assembly of claim 3 wherein the diaphragm seal has a peripheral sealing bead, and wherein the upper housing member has a lower edge about the opening of the internal cavity, the lower edge having a groove, the peripheral sealing bead sealingly engaging the groove when the lower housing member is attached to the upper housing member.

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5. The liquid level assembly of claim 4 wherein the upper housing member has an outer land rim and an inner land rim, and wherein the groove is therebetween, the dimension of the outer and inner land rims determined to sealingly accommodate the thickness dimensions of the diaphragm seal and the peripheral
15 sealing bead thereof.

6. The liquid level assembly of claim 5 wherein the housing assembly has a shoulder recess, and wherein the knob members press the switching means thereagainst.

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7. The liquid level assembly of claim 6 wherein some of the knob members are arranged in an outer circular path.

8. The liquid level assembly of claim 7 wherein some of the knob members are arranged in an inner circular path.

9. The liquid level assembly of claim 1 wherein the housing assembly has
5 a shoulder recess, and wherein the knob members press the switching means thereagainst.

10. The liquid level assembly of claim 9 wherein some of the knob members are arranged in an outer circular path.

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11. The liquid level assembly of claim 10 wherein some of the knob members are arranged in an inner circular path.

12. A liquid level assembly for immersion in a liquid and for use with a pump, comprising:

a housing assembly comprising:

an upper housing member forming a housing cavity;

5 a lower housing member; and

means connecting the lower housing member to the upper housing member;

a switching mechanism supported in the housing cavity and connectable to the pump for actuating the pump in response to liquid head pressure;

10 a diaphragm seal disposed between the upper housing member and the lower housing member to seal the housing cavity, the lower housing member having at least one opening whereby the diaphragm seal is subjected to liquid head pressure, the diaphragm seal having a flexible portion disposed to abut and actuate the switching mechanism, the diaphragm seal
15 having a plurality of knob members that cooperate with the upper and lower housing members to support the switching mechanism.

13. The liquid level assembly of claim 12 wherein the diaphragm seal has a peripheral sealing bead, and wherein the upper housing member has a lower end that
20 surrounds the opening of the internal cavity, the lower end of the upper housing member having a groove, the peripheral sealing bead sealingly engaging the groove when the lower housing member is attached to the upper housing member.

14. The liquid level assembly of claim 13 wherein the upper housing member has an outer land rim and an inner land rim bordering the groove, and wherein the dimension of the outer and inner land rims are determined to sealingly accommodate the thickness dimensions of the diaphragm seal and the peripheral
5 sealing bead thereof.

15. The liquid level assembly of claim 14 wherein a shoulder recess is formed within the upper housing member and wherein the knob members extending from the diaphragm seal are disposed to press the switching mechanism against the
10 shoulder recess.

16. The liquid level assembly of claim 15 wherein some of the knob members are arranged in a first circular path.

15 17. The liquid level assembly of claim 16 wherein some of the knob members are arranged in a second inner circular path.

18. In a liquid level assembly immersible in a liquid to actuate a pump in response to liquid head pressure in which the liquid level assembly has a housing assembly having a housing cavity formed by a first housing member and a second housing member attached thereto, a switching mechanism being supported in the housing cavity, the improvement comprising:

a diaphragm seal disposed between the first housing member and the second housing member to seal the housing cavity, the lower housing member having at least one opening whereby the diaphragm seal is subjected to liquid head pressure, the diaphragm seal having a flexible portion disposed to abut and actuate the switching mechanism, the diaphragm seal having a plurality of knob members that cooperate with the first and second housing members to press the switching mechanism so that dimensional tolerances of the switching mechanism are accommodated.

19. The liquid level assembly of claim 18 wherein the diaphragm seal has a peripheral sealing bead, and wherein the first housing member has a lower end about housing cavity and having a sealing groove, the peripheral sealing bead of the diaphragm seal engaging the groove when the first and second housing member are connected.

20. The liquid level assembly of claim 19 wherein the first housing member has an outer land rim and an inner land rim bordering the sealing groove, and

wherein the dimensions of the outer and inner land rims are determined to sealingly accommodate the thickness dimensions of the diaphragm seal and the peripheral sealing bead thereof.

5 21. The liquid level assembly of claim 20 wherein a shoulder recess is formed within the first housing member and wherein the knob members extending from the diaphragm seal are disposed to press the switching mechanism against the shoulder recess when the first and second housing members are connected.

10 22. The liquid level assembly of claim 21 wherein some of the knob members are arranged in a first circular path.

 23. The liquid level assembly of claim 22 wherein some of the knob members are arranged in a second circular path.

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